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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/674,242 | 10/27/2000 | Susumu Hizukuri | | 4962 |

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EXAMINER

LEWIS, PATRICK T

ART UNIT PAPER NUMBER

1623

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/674,242

Applicant(s)

HIZUKURI ET AL.

Examiner

Patrick T. Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,7,8 and 10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7,8 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

Applicant's Response dated December 11, 2003

1. In the Response filed December 11, 2003, claim 8 was amended. Applicant presented arguments directed to the rejection of claims 1, 2, 4, 7-8, and 10 under 35 U.S.C. 103(a). Claims 1, 2, 4, 7-8, and 10 are pending. An action on the merits of claims 1, 2, 4, 7-8, and 10 is contained herein below.
2. The rejection of claims 1, 2, 4, 7-8, and 10 under 35 U.S.C. § 103(a), is maintained for the reasons of record set forth in the Office Action dated September 16, 2003.

Objections/Rejections of Record Set Forth in Office Action dated September 16, 2003

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1, 2, 4, 7, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schiweck et al. U.S. Patent 4,816,078 (Schiweck) in combination with all of the following viewed collectively: Weibel U.S. Patent 4,831,127 (Weibel-1); Weibel U.S. Patent 5,008,254 (Weibel-2); Saha et al. Applied Microbiology and Biotechnology (1996), Vol. 45, pages 301-306 (Saha); and Gatzi et al. *Helv. Chim. Acta.* (1938), 21, 195-205 (Gatzi).

Claims 1, 2, 4, 7, 8, and 10 are drawn to a process for the manufacture of L-arabinose by acid hydrolysis of a vegetable fiber wherein the concentration of the acid is

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0.01 to 0.05 N, the temperature is 80-150 °C, and the total amount of saccharides decomposed and eluted during hydrolysis is 30% or more on the basis of the dry substance and the proportion of L-arabinose in the total amount of acid-hydrolyzed monosaccharides is 50% or more.

Schiweck teaches a process for the production of crystalline L-arabinose from araban containing plant material, especially beet araban which was isolated from beet pulp after sugar extraction. The method as taught by Schiweck comprises the mild acid hydrolysis of beet pulp at a temperature of 92 to 97 °C for 70 minutes wherein the sulfuric acid concentration is 0.5 to 2.0% (w/w) (column 2, lines 19-60) as instantly claimed. As any artisan in the field would be aware of, the sulfuric acid concentration when converted to normality is 0.1 N to 0.4 N. L-Arabinose is nearly extracted completely while other carbohydrates such as galactose, rhamnose, and galacturonic acid remain in oligomeric/polymeric forms (column 2, lines 29-32). The solution is then neutralized, filtered to remove any precipitates, and concentrated. The purity of the L-arabinose is 85 to 89% at this point (column 2, lines 38-41). The solution is then concentrated further, cooled to room temperature to crystallize the L-arabinose, and recrystallized from water (column 2, lines 45-60).

Schiweck does not teach the use of a vegetable fiber but rather teaches the use of sugar beet pulp. Schiweck does not disclose the weight percentage of L-arabinose present in the sugar beet fiber. Schiweck also does not disclose the solid concentration of the sugar beet fiber prior to hydrolysis or the percent composition of the saccharides decomposed during hydrolysis.

Weibel-2 discloses the composition of beet pulp as being largely L-arabinose, D-galactose, and D-galacturonic acid (column 3, lines 21-25) with over 70% of the pectin being L-arabinose and D-galacturonic acid (column 5, lines 42-46). Pectin is the generic term for the dominant polysaccharide (column 3, lines 25-26). Please note that D-galactose and D-galacturonic acid described in Weibel-2 are unnecessary components to attain the object of the present invention, applicant is reminded that the transitional phrase "characterized" is open-ended and, as such, does not exclude the galactose and D-galacturonic acid described in Weibel-2.

Weibel-1 discloses a method for isolating biopolymers from sugar beet pulp. Weibel-1 discloses the beet pulp being made into a slurry of about 4 to 12% total solids and then hydrolyzed under mild acidic conditions wherein the concentration of the acid (HCl) was 0.01 to 0.10 N (column 17, lines 48-57). The pulp material was recovered quantitatively with 50% being in a particulate form and 50% solubilized (column 14, lines 16-19). After hydrolysis and removal of solid particulates, the solution is concentrated containing about 50% arabinogalactan, about 40% pectin, and about 10% other polymers (column 14, lines 28-37). Arabinogalactan and pectin were estimated by the concentration of L-arabinose plus D-galactose and D-galacturonic acid respectively (column 16, lines 34-37).

Saha teaches that L-arabinose is obtainable from corn fiber acid hydrolyzate (page 301, column 2). Gatzi teaches the catalytic hydrogenation of L-arabinose using Raney Ni and H₂ to produce L-arabitol (English Abstract). The method by which the L-arabinose was produced does not render the method of Gatzi unobvious.

It would have been obvious to one of ordinary skill in the art at the time of the invention to manufacture L-arabinose by acid hydrolysis of a vegetable fiber wherein the concentration of the acid is 0.01 to 0.05 N, the temperature is 80-150 °C, and the total amount of saccharides decomposed and eluted during hydrolysis is 30% or more on the basis of the dry substance and the proportion of L-arabinose in the total amount of acid-hydrolyzed monosaccharides is 50% or more as the general methodological steps as claimed are known in the art. The choice of a suitable starting material is seen to be well within the purview of the skilled artisan. One would have been motivated to combine the teachings of the prior art in order to increase the yield of the L-arabinose isolated by the process. The quest for higher yields of L-arabinose is deemed to be sufficient motivation for combining the teachings of the prior art.

5. Applicant's arguments filed December 11, 2003 have been fully considered but they are not persuasive.

6. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's assumption that there is no need to argue on *Schiweck et al.*, *Weibel-2*, *Weibel-2* and *Gatzi et al.* is indeed in error. While it is true that the Examiner did withdraw the rejection of claims 1, 2, 4, 7, 8, and 10 under 35 U.S.C. 103(a) as set forth in the Office Action dated April 8, 2003, a new grounds of rejection was set forth in the

Office Action dated September 16, 2003. The prior art cited in the Office Action dated September 16, 2003 was appropriately set forth and the manner in which it has been applied is proper. Applicant's failure to respond does not obviate the rejection of record.

Conclusion

7. Claims 1, 2, 4, 7, 8, and 10 are pending. Claims 1, 2, 4, 7, 8, and 10 are rejected. No claims are allowed.

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

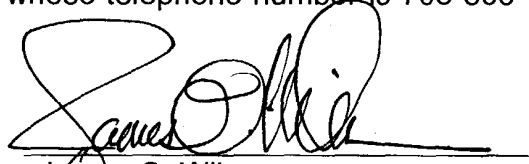
Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick T. Lewis whose telephone number is 571-272-0655. The examiner can normally be reached on M-F 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 571-272-0661. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Patrick T. Lewis, PhD
Examiner
Art Unit 1623



James O. Wilson
Supervisory Patent Examiner
Technology Center 1600

ptl
February 22, 2004